

# AVIATION WEEK

A MCGRAW-HILL PUBLICATION

APR. 9, 1951

\$6.00  
A YEAR



## Why Helicopter Pilots May Soon Have Four "Hands"

The unique construction of the helicopter not only makes it mighty useful in peace and war, it also creates a unique set of stability factors. Pilots need special training and ability which is different from their fixed-wing experience.

But helicopters may soon acquire a new reputation for ease of control — thanks to Honeywell's continuing research on aeronautical control problems. At the request of the Air Materiel Command, and working with Goodyear Aircraft Corp., Honeywell engineers have successfully adapted the

Honeywell Autopilot to the helicopter's special needs.

Experienced pilots say the result is "amazing" — that it's *as good as having four hands*.

That's just one of many aircraft control problems now being researched and solved by Honeywell engineers. We expect to solve many other control problems in the years to come — because *automatic control* is such an important part of aviation progress. And *automatic control* is Honeywell's business.

Aeronautical Division

MINNEAPOLIS-HONEYWELL, MINNEAPOLIS 8, MINN.

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**Honeywell** *Aeronautical Controls*

According to John and Sandra  
believe, another way to bring  
peace to the world is to  
bring it to the world of the  
future. It is not a dream, it is a  
reality. It is a reality that is  
being created by the  
people of the world. It is a  
reality that is being created  
by the people of the world.



That is one of the reasons for OSTUCO's success. For OSTUCO Aircraft Tubing—while meeting the most exacting Army, Navy and AMS specifications—provides inherent strength without weight advantage. In addition, OSTUCO Tubing has specialized forming and machining qualities which make it the best material available for fast heat, engine mounts, landing gears, and other applications.

The first "Chrome-Moly" manufactured was an OSTUCO product and today OSTUCO tubing, produced by one of the nation's largest suppliers of aircraft tubing, is used by 26 leading U. S. plane builders.

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## OSTUCO TUBING



Repairing • Imaging • Cloning • Banding  
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# Aviation Week

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**UNITED AIR LINES, 1926-1951:** From single-engine biplane begins in the double-decked Mainliner Series—now in overwater service to Hawaii, United Air Lines has opened a quarter century of air transport growth. To date, United has flown close to 516,440,000 revenue passenger miles and more than 240 million cargo miles. In 1951, United Mainliner Series—now in service with Tri-jet Aircraft Engine D4—completes—serves 85 cities and 22 states, as well as the District of Columbia, British Columbia and Hawaii.

**TEXACO  
TOASTS**

## UNITED AIR LINES' 25<sup>TH</sup> BIRTHDAY

A carrier with 25 carriers, and a record of growth extending in transportation history, mark United Air Lines' birthday this year.

In the quarter-century between 1926 and 1951, United—the first commercial commercial air line—has expanded its system from 460 to 13,250 route miles, added its personnel from 10 to 10,000, and increased its fleet from six single-engine, open cockpit planes to 139 jet Mainliners.

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## NEWS DIGEST

### DOMESTIC

American Airlines has ordered three Douglas DC-6A cargo planes, which will up the carrier's air freight fleet to 16 and will boost AA's cargo air lift capacity by about 3,716,000 lbs. under monthly. The line also has 17 DC-6Bs on order to be delivered this year.

The upcoming MF1F-6 Panther will be the next new Grumman design to fly. Powered by a J4W-34, the plane will be capable of supersonic speeds in level flight, and will probably be used as an interim type pending service out of the big, new variable-sweeping 360 mph F1F-1, prototype of which is now under construction.

Fast 108 Conquest 340s will be fitted with Alteksearch air conditioning and pressurization system. The aircraft calls for installation of 23 different Alteksearch items which form the equipment. The company has already been given contracts to do so as well as the Martin 4-4 and Lockheed 1049 Super Conquest.

Alexander R. Karpik, known for his strong plane design and who also worked with Sikorsky on various helicopter projects, died in Badger, Conn., at the age of 64.

Fairchild C-419 Falcon has recently completed series of Arctic suitability tests at Lake Umbagog, Alaska.

Conquest MF1F-4 has made its second longest flight, 4 hr 5 min. It was the big turbo-prop powered boar's head test log. Last August the plane established a world's endurance record for turbo-propowered craft when it was airborne for 8 hr 6 min.

T. Preston Lawford, president of American Aeronautical Corp., has been named since 1941, died at New York City at the age of 59. He became president of the firm in 1944.

Frank W. Hickman, general manager of Douglas Aircraft Co.'s Long Beach division, died at the age of 35. He joined Douglas in 1939 and was a project engineer on the DC-1, forerunner of the company's commercial transport plane.

Research and Development command of USAF will be based at Farned Day, August, near Baltimore, under present plan. RDC has been transferred

only headquartered at Wright-Patterson AFB.

Request to cut CAA 1951 fiscal year budget for the Air Navigation and Development Program from \$5 million to \$1,835 million was sent to Congress by President Truman last week. The reduction is substantially the cut American Waco reported would be made, Aug. 2.

### FINANCIAL

Sperry Corp. reports profit, after tax, of \$4,538,718 on sales of \$162,454,991 for the year ending Dec. 31, 1950. Backlog as of February 1951, totaled \$150 million. Separate results of Sperry Gyroscope and Vickers, Inc. divisions—which are responsible for most of the corporation's aviation production—were not disclosed.

Continental Motors Corp. is now filing applications for a \$50 million V loan, which is being set up with a group of 10 banks about credits in the U. S. The company has already been guaranteed by U. S. fiscal agencies. The loan has been made since the financing scheme set up by the government during World War II.

Texas Eagle & Mfg. Co. reports profit, after tax, of \$50,788 on sales of \$12,795,566 for the year ending Dec. 31, 1950. For the preceding year, profit was \$945,375, after tax, on sales of \$12,993,342. Texaco's Los Angeles Aircraft subsidiary had sales for the year ending Dec. 31 of \$1,000,000, the first three months of 1950 of \$207,424, making a total of \$1,212,135. Texaco's backlog is about \$65 million.

### INTERNATIONAL

British Overseas Airways Corp. will cut back its order for 25 Bristol 175 turboprop transports, according to Minister of Supply Stewart in speech in London newspapers.

Gloster Meteor 8 jet fighters are being delivered to the Royal Australian Air Force for use in Korea.

Fairchild C-419 is being expanded more than 100 percent from 2000 to 4000 acres. Expansion will be financed with \$50 million loan from Marshall Aid counterpart funds.

Three (Wing) Waco, an British four pilot, was killed when passenger Blenheim P 1681 jet fighter exploded in flight and crashed.

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**SIDELIGHTS**

**Pilot ID Cards**

CAA says pilot identification cards will be mandatory by Sept. 1, with applications available in CAA field offices by Apr. 15. Forms must be completed in presence of a CAA official and will be forwarded to Washington by mail.

**Airlines**

American's president, C. R. Smith, has returned to the airline after two months' duty as Air Force general advising Undersecretary John McGowan on procurement.

**Maintenance Delayed**

Extreme Southern Flare, short work model version of last year's Extreme Navigator, has been postponed from June to mid-August. Simulated battle problems in logistics and technical support problems are cited. In time said Army-Navyjet Flare maintenance. Delay will enable more critical components to join.

**Civil Aviation**

Sky Pilot Flying Service, Columbus, O., denied an Ohio highway authority, saying down will speed from the hopper of an experimental very short plane. They believe, pilot, flying at 50-75 ft altitude, but the rule on the highway is a mile each two minutes, using 200 ft of mile per mile. The test was cancelled at 100 ft. The Ohio Aviation Board and State Highway Dept. will conduct research. Southwestern & Flare, Inc. has arranged with Manufacturers Mutual Life Insurance Co., St. Paul, for a group plan under which any AOPA member may obtain a \$50,000 life insurance policy, at a million miles at a flat rate of \$10 a year. Plan will go into effect as soon as 10,000 members apply. AOPA's annual office are moving to Bethesda, Md. (P. O. Box 1948, Washington, 14, D. C.) but corporate office remains in Room 4115 Washington Bldg., at downtown Washington.

**CAB**

Former director of the now reorganized Economic Bureau, Robert J. G. McClellan, has been named to a State Dept. job. Deputy Director of the Office of Northeast Affairs. McClellan found his CAB job extremely complicated when Chairman Randall retired in October. McClellan is head of the new Bureau of Air Operations in January.

**The Press**

Congressional Record reported Sen. Lee's 1964F Troop Support show from American Works of Pitt. N. Y. Herald Tribune columnist R. G. G. and "Watch for CAB to furnish first page today any edition." Street News indicated column Apr. 3 and "Another agency on the list of likely (Continued on page 84)



**SABRE DE-MOUNTED**—A sub of deadly Mighty Sabre acrobatic acrobatic properties are fixed from a North American F-60 Sabre all-weather fighter, which packs 34 of the 375-hp Navy-developed engines. Fine is an large-scale production for USAF and Navy (F-2).

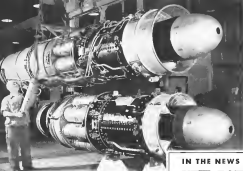


**Aviation  
Picture  
Highlights**

**REBUILT THUNDERBOLT**—First view of the Armstrong-Sidley Superpower-powered F-60F shows the plane taking up its wheels after takeoff. The air inlet ramp appears to have been modified to give increased air, probably to handle the expected greater air handling capacity of the big 30-hp designed and for jet engine. The new engine is approximately rated at 7500 ft. state thrust, considerably more than the 1000 ft. previously fitted to the F-60F. The Superpower Thunderbolt will be manufactured by Republic and General Motors, using engines built by Curtiss-Wright.

**HEAVY ARMY AMBULANCES**—Two M101A2 ambulances (below left) display their capacious externally mounted litters. The rocket troop detachments new placement of the control stick (they were mounted overhead). The horizontal bar is for collective patch control.





J47-17 (lowest engine [upper], one of new engines now in production, at G-E's Lynn, Mass. plant, features integrated electronic fuel and jet nozzle system for completely automatic control of engine and afterburner. New fuel system is designed for operation at 50,000 feet, opposite polarity system allows starts at that altitude.

Designed to suit your specific needs, turbojets, turboprops and turbopropellers are available at General Electric. The complete line of aircraft gas turbines is backed by forty-five years of experience. Specialists in every phase of aircraft gas turbine work serve you.



Water-cooled prototype lets G-E engineers look directly into hot exhaust gases in jet test pipes. Study of these burning gases is invaluable in the improvement of aircraft gas turbines. Research tools such as this are constantly being developed at G-E to give you better power.

of quality and dependability. For aircraft powerplants that are constantly being improved, call your General Electric aviation specialist or write: Aircraft Department, General Electric Company, Schenectady 3, New York.



World endurance record won out of Selfridge AFB by this North American F-86 powered by G-E J47. Plane landed every two hours for refueling but was operated continuously for 23½ hours. Civilian use was top priority from widespread G-E service organizations.

## IN THE NEWS

# NEW POWER NEW RESEARCH NEW RECORD

## WHO'S WHERE

### In the Front Office

Lee Douglas, chief engineer for Pacific Helicopter Corp., has been promoted to the newly created position of vice president engineering. Douglas has been with the company since 1949 as chief engineer, and prior to this unit with Bell Helicopter from 1944. There he supervised the MH-37 design, most notably by Hughes Aircraft. McCallister Wilcox has been named vice president sales and, Brian P. Blot, Jr., has been made vice president operations at Bell Helicopter. Wilcox had been general sales manager and Blot, operations manager. Both men have been with the firm eight years since its early days.

Charles W. Fennel has been appointed first vice president general manager of Grumman Aircraft. Guy of the development of Westinghouse's first, France during World War II was vice president general manager of the Grumman Aircraft plant, and for a time also headed that firm's Buffalo, N. Y., facility. He has been serving as an advisory member to Grumman since 1950.

Stanley O. Dilling has been made vice president of engine and rotor for Continental Air Lines, and Louis H. Deane has been appointed vice president of GAI's light aircraft department.

### What They're Doing

Robert P. (Dick) Bohanan, vice president of the Firing Tube Line, has left the company to join the Pacific Gas & Electric Co., where he will serve as vice president of the company's new Santa Monica office. A former member of the American Volunteer Group (Flying Tigers), he later joined Robert W. Fennel in the founding of the West Coast-based center. He returns his service to the company.

K. Robert Hale has resigned as secretary and assistant vice president of Lake County Airlines, Inc., in San Jose, Cal., in the office of contract administration. Hale joined the airline in 1949 when it was started and operated.

### Changes

George S. Cooke, Jr., has been appointed manager of the General Electric & Pratt & Whitney project and, M. E. Gault has been named manager of various operations at the same plant to work with English Electric, the plant's parent firm. W. Z. Douglas, one of the president of Douglas Aircraft, has been appointed general coach of the company's new aircraft production at the company's Santa Monica plant.

Douglas M. Deane has been named chief engineer of Chrysler's Aviation Engine Plant 1 in Buffalo, which will produce jet engines. William K. Reed has been appointed plant engineer. Martin V. Kohn, Jr., has been made general manager of Chrysler Aviation Corp.'s aircraft plant in Los Angeles.

## INDUSTRY OBSERVER

► Boeing's 175-hp. gas turbine is getting a service test at Annapolis in a Navy personnel boat.

► Texas A & M College's experimental agricultural plant developed by Fred Wink is starting GMA type engine tests. New wingtips designed to add a greater dihedral effect, have been added and are now ready for test.

► Texas Engineering & Manufacturing Co. has leased Midway Field, at Greenville, Tex., and will transfer its oilfield and maintenance operations to this new facility as rapidly as it is required by expansion of its production of defense aircraft and major assemblies at its main plant at Grand Prairie, Tex.

► Watch the new McCulloch Motors Corp. tandem helicopter in a very strong potential big league competitor with the other tandem copters, such as Panavia and Bell. Designer of the new McCulloch machine is D. E. Jonesworth, who was in charge of engineering for Panavia in the XH-40 Navy Reserve prototype tandem helicopter, and who developed the JOW-5 interlocking rotor tandem helicopter. The two place MC-4 McCulloch machine which the Navy is buying is a twin for the larger tandem which Navy is buying from Panavia and Bell. But it is a twin not as expected, McCulloch will probably have a strong competitor in larger tandem copter production as well.

► Interesting indication of the increased amount of aircraft engineering work, expanded as engines aircraft is the Lockheed report that in 1953 the company spent about one engineering hour for each ton in the factory while to date the proportion is about one to four.

► Bell's move of its helicopter operations to Ft. Worth, following a previous Bell move of its jet engine nozzle program for the B-57 and B-56 to Ft. Worth, doesn't mean the company is pulling out of Buffalo. In fact a backslide between the two areas indicates that Bell now employs over 8000 in the Buffalo area, compared to about 2000 now programmed for Texas and factory space amounts to around 17 million sq. ft. in the Buffalo area, compared to 400,000 sq. ft. programmed for Texas.

► Latest remark in landing gear is a proposal by Avco Corp. of Engineers for glass laminated plastic landing gear, built in layers so that a fighter strip can be converted to a bomber strip, if necessary, by adding more layers to strengthen it. Determination of the plastic laminate for use as landing gear is so serious that the plastic laminate is being seriously considered, along with new type metal gear. However, it is understood that current supplies of glass laminates would have to be greatly expanded in order to meet requirements for the metal, if they were reduced as quantities.

► Conquest is buying components and accessory systems for the Conquest 110 14-passenger motor in blocks of 100 on the basis of current orders which only 35 plans including some options for additional planes.

► Advanced version of the Allison T-40 turboprop is rated about one-third more powerful than the 1950 equivalent that is attributed to the first T-40s now flying in the Douglas A1D and Conquest XP5Y-1 flying boat.

► Fair Post and Whitney T-34 turboprop engine rated at 370-horsepower shaft hp are expected to go into the first Conquest XP5Y-1 after completion of its tests with the Allison T-40s which now power it. Meanwhile, the second XP5Y-1 scheduled to fly later this spring, also powered with Allison, is to be tested in a more basic and for other long range use.

► Very lack of interest in the Hughes flying boat is traced to the opinion of its first test operators that the design of the big eight-engine boat was not good in its day, but that it has been outmoded. Disappointment of some advanced hydrodynamic and aerodynamic principles is found in later analyses such as the Conquest XP5Y-1 and the Martin P5M, and still newer designs which may be well on the way to completion before an all-out version of the big Hughes craft could be built, if it were started today.

AIRCRAFT GAS TURBINES  
**GENERAL ELECTRIC**

## Strategy: A Political Issue

Military strategy is likely to be the big national item of the 1972 election. Republican National Committee is at it now as making it so.

Defense costs, even if they're kept under \$50 to \$60 billion a year using by the Administration, will account for three-fourths of the national budget.

Democrats will have to face up to a Republican campaign based on a military program which will be presented to the voters like this: "For \$40 billion a year, you can have an unrepayable program. For \$60 billion a year, the Administration isn't even giving you adequate defense. The Administration program, to be properly implemented, would cost \$100 billion a year. The first Chiefs of Staff estimate that."

Here is how the Republican program would divide military funds:

• **Air Force:** Most of the eggs would go into this basket. To build up a gigantic strategic air arm, as much as 75 percent of the defense budget would be channeled into USAF. Under the Administration program, USAF gets a 31-percent slice. Army and Navy would be reduced to USAF "dependencies" to support the primary language building, i.e.

• **Navy:** Although Republicans believe in navy shipbuilding, a "big" Navy, the concept of this is a Navy substantially smaller than the first one it began—which was greater than the combined fleets of the rest of the world. Navy's primary mission would be support of Air Force bases. The carrier mission would be greatly reduced. The expense for long range attack at home would be cut. Navy's mid-range bases would get at least a 10-percent level. Reasoning is that an air war would require insurance of the fleet, not at the sea.

• **Army:** Its strength would be slashed to "a small mobile force," plan forces to support Air Force bases—a mission of 10 divisions programmed by the Administration.

This GOP program is based for a direct war with Russia. Behind it are these political convictions: The U. S. cannot afford to disengage its strength in an endless series of Korea. It must lay down the line on what Russia expects it will consider threats to U. S. security. If not where Russia crosses the line, the center of the U. S. should be to launch its air might against the main enemy.

Army's Big, Gen. Omar Bradley (R), now under secretary to the Department.

The theory over whether the Air Force might get a lot, loses dollars each year is running on the perimeter. What's required is a thousand fundamental changes in the defense concept. The time has arrived for the Air Force to lift its primary role of America's first line of defense—the old Joe. Billed up to 1943. The other two services should be adjusted in supporting arms of the strategy are seen.

"The Administration program of 'dividing the defense dollar' is directed at nullifying the services, not at achieving defense for the U. S. This must go out."

The Administration program is the Army. Its defense leaders, all great efforts can't convince me as yet. The State Department is "big news," too. Its diplomatic efforts are strengthened by introducing U. S. displays here, there, and everywhere in the world. At best, the Army-State Department conflict that's sold

still to the President, implements diplomacy—not the defense of the nation."

Republican National Committee hopes to see two continuing issues to emphasize support of its program. • **Gen. Hoyt Vandenberg:** One Republican senator put it: "Vandenberg is a free world hawk, reported the Admiral Truman's plan for ground support for Europe. When he did, he thought the Administration was going to give him funds for his 35 group Air Force. But he isn't going to get funds for implementation of that program. When he comes up to Congress in a month or so, we don't think he's going to endorse expanding funds for land forces to support the Air Force for a bipolar ground war against Russia at the expense of — his air program."

Vandenberg believes that if he stays too far from the Administration, he'll be replaced as Chief of Staff by the Air Force by a down the line. You must go ground attack, military and control, and Russia, in taking three under leaders of the Administration's plan."

• **Gen. Douglas MacArthur:** High Republicans report MacArthur is 100 percent behind their plan for building up an all-military defense on sea, land to a direct war with Russia. And, one said: "We expect him to talk up the matter after the situation in Korea is settled—whether he's at hand by then or not."

## Vandenberg's Play

Sen. Kenneth Wherry wants to know what are Air Force for U. S. ought to have—and at what cost—to meet security as a direct war with Russia.

He asked USAF's Chief of Staff Vandenberg to supply the information at a session of the Senate's Foreign Relations Committee.

Vandenberg is going to submit the information requested. He is drawing it up personally, will submit at directly in Wherry. It won't go to Secretary of Defense Clark M. Abner for review.

The Vandenberg challenge is air power to defeat Russia will be based on "massed down" opposition.

But the estimates will show an answer two ways.

• They will highlight how much less as an opponent of Russia would not than the Administration's strategy of a holding action in Europe with ground forces.

• They will give Republicans and Democrats alike some ideas on a level to push back proposed for the ground forces this year into the Air Force.

## What Size Defense?

Sen. Lyndon Johnson's War Preparedness Committee will soon discuss, either in a report or public hearings, the starting line on costs of defense equipment.

A quick guess, by the three reports in December indicated they could reach partial mobilization strength by mid-1952 with a \$70 billion appropriation. But when this based up three figures in late 1951, it added up to over \$100 billion.

The Administration means to spend the \$300 billion program under the 170 billion ceiling.

But a \$70-billion program can still purchase only what a \$45-to-\$60-billion program would have purchased in 1951. The Johnson committee membership will show —Robertson Johnson

# AVIATION WEEK

## Avionics Gets Own AIA Technical Group

### Electrical and electronics subcommittee set up to handle standards and specs.

By Alexander McCrory

An important new aviation industry interest organization to tackle the tremendously complicated problems of standardization and specification of electronic equipment such as airplanes, air navigation and control, and missiles, is taking shape under leaders of the Association of Aircraft Industries (AIA's technical staff.

Participation in the new technical group by such aircraft companies as Convair, North American, Northrop, Hughes, Ryan, Perchell, Bell, Martin, McDonnell, and probably many others, is another effort to the sizable amount of engineering standardization which major U. S. aircraft companies are now making in the new, tricky processing field.

Under plans tentatively agreed upon, they will join with such companies as Sperry Corp., Bendix Products Corp., Bendix Electric Corp., Bendix Scientific Corp., Minneapolis-Honeywell, Aeroflex, Inc., General Electric Co., (aeronautics for space division), Sperry Gyroscope Co., Westinghouse Electric Corp., and Jack & Heintz, Inc.

One of the programs of exchange of information on common avionics technical problems.

• **Membership:** Largest—Membership in the organization which is due to be established in the next 15 days, will be limited to manufacturers who are producing electronic aircraft equipment for industry availability. It will not include manufacturers who are producing electronic equipment only for government use in their own aircraft. Boeing, Douglas and Lockheed are the most prominent aircraft manufacturers in this latter classification. Presumably they may come into the committee later if they make their avionics production more generally available to other members.

Other likely members are such aircraft manufacturers as Chance Vought Republic and Grumman, and Douglas Aircraft, although neither Grumman nor Convair are at present members of AIA.

Main problem in setting up the new organization has been the interplay of conflicting interests of the avionics companies and the airlines.

Manufacturers who are moving into the avionics field. Consideration was given to setting up two separate technical subcommittees to accommodate the special interests of each group. But the more logical method of including all avionics producers in a single unit has apparently prevailed.

• **Subcommittee:** Electrical-It will be known as the Electrical and Electronics Subcommittee of the Avionics and Equipment Technical Committee of AIA. G. B. Stullberg, (production engineer for Minneapolis-Honeywell), was elected first chairman of the committee at an organization meeting in Dayton recently attended by representatives of Lockheed, Eclipse Products, General Electric, Westinghouse, Hughes Aircraft, Jack & Heintz, Sperry and Thompson Products (which is neither likely member prospect).

As a result of discussions at this and later sessions, it was agreed to invite the avionics companies to participate.

At the first session, it was agreed that the joint Army-Navy specification I-A for aircraft electronic tubes (IAN I-A) was too loosely drawn to obtain the rugged and reliable tubes needed for aircraft use. Thus followed the establishment of the new sub-committee's first working group, the AETC electronic tube panel headed by G. A. Wolf, Eclipse Products chairman.

The tube panel has already started a tentative list of 11 of the most used electronic tube types, and is circulating a letter survey for comments as to changes desired in the types to meet present and future needs.

As a result of the survey, the committee will set up a working group to develop a new standard, what troubles have been encountered, and what should be specifications to make the tube reliable. The team has set up the following items: 5Y5, 6AK5, 6AL5, 12AU7, 12AX7, 6X5, 6X4, 58T, and 5Y5.

Panel members have pointed out that about 10 percent of all tubes received did not meet the IAN acceptance tests and that there is considerable variation in quality between different avionics "house" products.

• **Problem for Avionics:** One problem in improving the quality of the tubes to the high standards required for av-

ionics use is in improving the tube manufacturers that such high standards are required, advanced electron tubes. The tube manufacturers have been producing to standards for home equipment use, which are inadequate under the extreme temperature variations and vibration and shock conditions to which aircraft equipment is subjected.

It has been proposed that the IAN I-A specification be implemented with a "regulated tube" section which would apply to aircraft electronic tubes.

And if this has been further agreed in a tentative to propose that any manufacturer who will guarantee that his tube will meet IAN requirements will be allowed to put the IAN brand on his product whether it is used in military and space or other applications.

• **Manufacturers:** Westinghouse-Bell Laboratories (Western Electric affiliate), RCA, Westinghouse, and Radio Tube Manufacturers Assn. will be at it with the panel on tube problems to represent the tube manufacturers.

These panels have been set up at a total of ten planned. Each will handle a specific problem, with solved, then will be distributed as new panels attend new problems.

A military avionics panel will do short-range electronic tube-shooting relating to Convair B-58 and Boeing B-70 airplanes. Microwave problems for bomber electronic equipment are, reportedly, tentatively involved. Many tubes are tested in, assembly in accordance for replacement in event of a breakdown. This will be in many as a thousand tubes in some plane installations.

Third panel is a group requiring into radio noise measures and limits.

• **"Regulated":** Problem of "regulated" tubes, which are of general use in other research groups as well. American Radio Inc., has set up a tube reliability program confined to communications tubes also available to the Defense Department's Research and Development Board also is having 15 aircraft for a research program to develop better tubes able to stand shock.

Some engineers visualize that a virtual replacement of many present-day electronic tubes will be necessary in order to get the precise temperature and atmospheric conditions and other vital working conditions necessary to improve the high degree of perfection which is the goal.







## Marine Copters

While Army is still pushing to get its first assault transport helicopter, the Marine Corps has commissioned its first three outmost helicopter squadrons at Cherry Point, N.C.

The squadrons will be organized to supplement existing lighter and transport units of the Second Marine Air Wing. Initial equipment will be single-engine Sikorsky HO4S (H-19) helicopters. Delivery of the ten-place H-19s and the six-place HO4S will begin in May.

**22 troops.** A single Wright R-1823-76A engine developing 340 hp, four men (three-bladed 44 ft. rotor system). Weight empty is 7224 lb, gross weight is 10,313 lb, fuel load is 2800 lb including 815 lb fuel and oil.

**Maximum speed:** 130 mph, cruising speed 115 mph, climbing speed 104 mph, vertical climb rate at sea level, 1800 ft./min.; hovering ceiling 13,000 ft., service ceiling 16,000 ft.; range at 9000 ft., with normal fuel, 670 mi.; ferry range 1435 mi.; endurance 21 hours.

**Sikorsky HO4S:** fuselage is 41 ft., 8.5 in., rotor system capacity 12. A single Pratt and Whitney R-1190 S-62 engine turns a single 52 ft. rotor. Weight empty is 4395 lb, gross weight, 6500 lb; fuel capacity 180 gals.

**Maximum speed:** 113 mph, cruising speed 86 mph, vertical climb rate at sea level, 1600 ft./min., hovering ceiling 9000 ft., absolute ceiling 16,500 ft.; normal range is 463 mi.

**Pasadeni HUP-1:** Details of the copter have not been disclosed but Army sources state it is a slightly larger version of the Pasadeni HUP-1C. The latter has a fuselage length of 32 ft., and seating capacity of 7. Weight empty, 3524 lb, gross weight, 5478 lb. A single Continental R-840 engine turns three three-bladed 35 ft. rotors. Navy is buying three copters for Army.

**Maximum speed:** at sea level, 125 mph, cruising speed 100 mph, vertical rate of climb 1500 ft./min., absolute ceiling 12,000 ft., normal range 480 mi.

Army sources state the HUP-1 can accommodate a slightly higher number of troops than can the HUP-1C and that its range and speed are somewhat higher.

While point and counter-point at Fort as made on top USAF Army claims to work out discrepancies between the two services in reference to an transportation needs, Army is aggressively moving steadily ahead with plans for an expanded role as a

Army helicopter company. To meet the needs of a highly flexible combat ground unit, Army has ordered units to form the nucleus of mobile companies where they will be organized for corps, division and smaller tactical units. The H-19 and H-19 helicopters just ordered will provide transport equipment for these companies. It is expected, however, it is understood.

**Pilot training.** Long concerned with AF's World War II policy of deserting without fighter and bomber missions to home ports, Army is studying for replacement of orders directly to Army pilot schools. While the program is still embryonic, a step in that direction has been made with recent Army publication of a directive asking its aviator components to "volunteer" for pilot training.

**Airborne units.** Two years ago Army proposed establishment of a joint airborne "study center" at Ft. Rucker, N.C. to aid development of a modern airborne fighting force. Original proposal for a joint tactical integrated support problems, largely when USAF declined to go along with the idea.

Last year Army sent ahead and established the center, placing Maj. Gen. Robert M. Meyer as commander. He has pressed mission of the center to foster advanced airborne techniques, doctrines, tactics, weapons and equipment, as well as the military service industry has had to this point. Air Force and Navy both now have up "coordinating" offices at the Ft. Rucker center.

In the helicopter field, Army plans its main thrust. It is developing the Pasadeni HUP-1C with its probable 6000 to 6000-7000 payload as base for potentially all future Army air transport. To give its newly expanded helicopter company training, Army is using the H-19 and H-19.

## CAB Sets Up

### New Code of Ethics

Civil Aeronautics Board has established a new code of ethics defining principles of conduct for staff, its staff and those who do business with it. Many of the code's general principles are similar to those already proposed by Senate Panel Douglas in its cooperative with Aviation Week (Nov. 28 issue).

The Board makes a special point of emphasizing to CAB procedure to stop any "considerable and repetitive" evidence.

**Chief writes rules on**

**No public pressure** in such action measures as going, "unilaterally" to the press or making "damaging" to the Board's judgment in the

case. How this will affect non-attorney staff in one respect one telling how "absolutely" Senator's Captain Kerkenshake is "by today's action of a majority of the board" is uncertain.

**No delay for** such action or members on the merits of a case by those with a business interest in the case.

**Members** of a case must present personal judgment of it, not inquiry as to facts of case, it is understood.

**No audience** putting by filing any spurious evidence. Parties must keep their facts concise.

**No witness** and during to influence the Board on a case. The new regulations forbid "unusual" language.

**Attorney's honor** is relied on by the regulation to prevent introduction of a case or piece of evidence not having directly in a case. Thus, the attorney-client relationship clause of the regulation (310.5) makes the attorney responsible for any case delaying tactics or other subterfuge. If the client believes (unusually) the attorney "should" present false information.

Denial of the Board's rules will be disqualification from the privilege to appear or practice at CAB.

The new "regulations of practice of the CAB" were drawn by the specially appointed committee on practice and procedure, made up of well-known airlines, mostly airline attorneys.

## Senate to Query CAB on Non-Skeds Role

Senate Small Business Committee's investigation into the role of non-skeds in air transportation is going to draw the curtain and open on Civil Aeronautics Board.

Hearings are scheduled to open Apr. 19. Committee's counsel, Laurence Henderson is going full blast to prepare for them.

Newsday, at the request of the committee's chairman, Alabama Sen. John Sparkman, CAB has postponed, from Apr. 6 to May 6, the effective date for its order limiting non-skeds to three seats monthly between any two points.

Non-skeds are charging that the order, and other Board action, are the result of a "conspiracy" of the scheduled airlines, in which "trust and corruption" figure, meant to drive non-skeds out of business.

Sparkman has issued a thorough investigation and array of the non-skeds charges. "We don't know whether they will stand or fall," committee counsel Henderson told Aviation Week, "but we are going fairly into them."

Henderson anticipated that present members of CAB, its past members, CAB staff personnel attorneys who have handled cases before the Board, and industry attorneys will probably be called in to testify.

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## AERONAUTICAL ENGINEERING



COPTER of 1964, carrying 18-12 passengers, could be like the Bristol 173, new report of British helicopter committee.

### A Look at Tomorrow's Passenger Copters

British study group tells how rotary craft could dominate travel over routes in 50-300-mi. range.

By David A. Anderson

The United States helicopter industry has built on the foundation of our experience in England, with few helicopters and fewer even, than has to be a different basis for expansion.

And as the British have been passing their traditional approach—a detailed study of all related factors, carried out by a special working group. This is what the British did with jet propulsion and power air transportation. The results of these planned programs have put England far ahead of the rest of the world in jet transport.

In the helicopter studies, they have found some of the same answers that were learned here by cut-and-try methods and costly experimenting. But they have also proposed a number of rotary solutions which have not as yet found wide credence in the country.

Two Year Gostings—The Minister of Civil Aviation appointed the Interdepartmental Helicopter Committee in August 1948, the first report of the committee is dated about two years later, but has just been released.

It summarizes the committee's views on the prospects of the helicopter as a true commercial one on internal or serv-

ice in the United Kingdom, its effects on air service and airport requirements and the actual progress of development and experimental work for the helicopter.

To aid in forming its opinions, the committee heard many witnesses representing helicopter manufacturers, even and civil and military aviation. Members of the committee itself were chosen from the Ministries of Civil Aviation and Supply, the General Post Office, British European Airways and the British Air Charter Association. No manufacturers were associated.

As the committee's own advisory, it was not considered as a technical group but although the report shows a clear appreciation of the technical problems involved, the main emphasis is the consideration of the feasibility of the helicopter as a transportation medium.

Current Status—The committee survey of current helicopter status in the United Kingdom showed four major categories.

• **Bristol Aeroplane Co.** Two prototypes of the single-engine, 14-passenger Bristol 171 first Series, and the Ministry of Supply has ordered three prototypes of the Mk. 3 version which may become the production model. Two

series difficulties have delayed the project.

• **General Aircraft Co.** Ministry of Supply has ordered three W.16 single-engine, 14-passenger helicopters, two have been built. Two W.17 (Air Force) prototypes have been built, and one of these was lost in an accident. The craft is a two-engine, three rotor copter carrying 24 passengers.

• **Westland Aircraft Ltd.** This company produces the Sikorsky S-51 under license agreements. Series release of the report, Westland has obtained rights also to the S-55.

With the exception of the Air Force all of these are too small for use as public transport craft, and only one has been granted a Certificate of Airworthiness which permits the carrying of foreign passengers.

The committee also went on record as feeling "some concern" as to the defects which have come to light in the rotor system of all British helicopters other than the Westland S.51, which have no "flexion".

Future plans were also listed, naming four other proposed designs.

• **Bristol 173**, a two-engine, tandem-

rotor helicopter with a designed cruising speed of 113 mph, and a payload of 2042 passengers. The craft is under construction and should fly shortly.

• **Cirrus W177**, a two-seater, three rotor helicopter with a projected payload of 10 to 20 passengers or five tons of freight, and a cruising speed of 310 mph. Ministry of Supply has placed only a design contract for the mission of the basic Air Hawk design.

• **Fairey Rotabone**, a three rotorcraft, 25-passenger craft of novel configuration. This craft has been proposed to the Ministry of Supply which has authorized preliminary development.

As an adjunct to the committee's survey of current rotor wing status, there was an examination made of British European Airways' helicopter experimental unit, now completing its fourth year of operation. This unit is equipped with five American helicopters—three Sikorsky H-19 and two Bell 47Bs. The work of this unit has been valuable in assessing the operational and handling characteristics of both types and in the development of blind and night flying techniques.

• **Post Commence**—After surveying current helicopter status, the committee is now concluding which aircraft to direct its further thinking. There were in general that the helicopter was best

suited for short range (50-100 mi.) jobs; that for economic reasons, the service should be at high frequency, that they should operate from town center to town center, that at least two engines will be necessary for safety reasons, and that (and this point was stressed several times during hearings and in the report) the helicopter should not have the standards of passenger service now used on fixed wing trunk service. The committee stated that it was convinced that "...there is no other single factor which could so effectively make the development of the helicopter as an acceptance of the high costs inherent in a heavy service."

As a result of preliminary thinking and considering also the current level of technical development, it appeared that a 20-passenger helicopter would be an economic answer to the question of short range public transportation.

Since no such engine is being constructed in Great Britain, the committee set up its own design specifications, and British European Airways still drew up a plan for a helicopter powered by four Alfa Romeo engines. (This engine is currently used at 750 hp for boats) and shows possibilities of development to 500 hp.)

• **West**—The proposed craft would have an estimated gross weight of 22,

000 lb., would carry 20 passengers over a stage distance of about 500 mi., and up to 24 people over shorter distances. Estimated maximum endurance cruising speed is 142 mph.

Mechanically, such a helicopter should have folding blades, capable of being stored tightly and easily. Vibration and noise levels must be controlled. And a crash approach must be made to landing gear design to obtain lower density of load distribution.

Obviously, the helicopter should be capable of being flown by one man, it should require a minimum of handling aids and navigational aids, and it should be able to land vertically, power off, when necessary.

• **Traffic Control**—Consideration of future helicopter transportation must go beyond merely placing a rotary wing design, and as the committee also considered the problem of traffic control, landing aids design and costs.

Control facilities, and the committee has after hearing from a number of sources, should be related to traffic density and any necessary integration with fixed wing traffic movements. The system recommended is based on radio control rather than on air control.

The sky line was studied only on either side of helicopter routes, and from 500 to 2000 ft altitude are to be

more complex work. Preliminary plans point out to four control areas of four tubes and 2000 ft altitude.

Communications for such a control facility were carefully studied, and looked down to three basic types: portable telephone, radio terminal, and two other communications: telephone exchange, land, and VHF radio-telephone, be ground or in-flight.

Final communications consideration is that full reliance be placed on the VHF/R1 and that voice communications be used only where safety considerations make it desirable.

• **Landing Area Design**—Landing areas were considered by the committee as being a design criterion for the helicopter designer and not for the aircraft designer. The committee stressed that it should have the control to permit manufacturers to produce helicopters to fit landing areas, and not to rely on landing areas being provided to fit helicopter. It is a fresh approach to the subject of aircraft landing areas.

The problem was, in addition, to determine minimum area sufficient for realistic operational requirements and to set that area as a target for manufacturers of relevant craft. Landing area use should be determined primarily by helicopter dimensions: distribution clearance required, angle of approach, rate of movement and operational costs. Hours of landing whether visual or instrument.

For instance, the committee considered a helicopter with a maximum dimensions of 325 ft, and which could be cross-walked by a 125 ft diameter circle. This would allow for helicopter movement longer than the GCA W117 which has a maximum span of 112 ft.

The approach, the committee chose an angle of 55 deg with the ground as representing a conservative approach path. It noted that in recent helicopters, as several operations followed a 50 deg path but that the Civil Aeronautics Board in the United States does not require wide approaches, on the thought of air accident that the helicopter is specifically designed for vertical landing and takeoff. And it added the observation (which should be observed but which seems to need emphasis) that a design representative for future helicopters should be that they must be able to land vertically, power off.

The rate of movement, our helicopter was assumed to be in the landing area at any one time.

For operational conditions of landing, the committee believed that all landings would be made in visual conditions, in daylight or with light.

• **Minimum Costs**—With the above set, the committee considered the most demanding conditions for operation



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ing space. This condition occurs when one engine fails on takeoff and the helicopter has to land again at the same spot it has just left. On this basis the following aspects to be considered in determining recovery for any landing area:

- A square, 500 ft. by 100 ft., or
- An L or T, giving two areas each 150 ft. by 500 ft. intersecting at right angles, and
- An obstruction clearance at an angle of 26 deg. (slope 1:2) from the edge of the landing area.

With helik blades, one more heli-copter could be parked in the area above.

On ground sites, the committee recommended that an additional area 100 ft. by 400 ft. will meet all requirements at most sites, if there are to be a number of normal or emergency services. Helo area should be increased to 400 ft. by 500 ft. The exception would be roof-top sites where any such expansion of space would be prohibitively expensive.

The committee also considered the subject of roof-top landing areas, and found that there were few such attractions at such sites. There were concerns at land usage, partial roof obstructions in space nearby, maximum obstacle quantity during approach and egress, landing on roof tops often between tall buildings into ground sites.

Relieving advantage and disadvantage, the committee felt that it would be impracticable to design and strengthen the roofs of existing buildings, and therefore it would be necessary to construct special buildings for the purpose. This would mean large capital expenditures and perhaps could cause problems of town planning.

► **Emergency Landings**—In a single entrance, the committee presented the result of an independent investigation which compared costs of roof-top and ground landing under Chicago, Scott (and) Capital expenditure for a roof-top site would be about 40 times that of a ground site, and annual cost would be about 50 percent greater.

Further to the cost problem, the effect of noise and vibration on buildings have yet to be determined. There would be an inherent fire risk, although no worse than for indoor garages, artificial lighting and ventilation would have to be provided on a large scale.

Final recommendations on this score was that initial stages of helicopter service should be planned as on not in call for building construction. If heli-copters can be operated into large cities, they should at first use either nearby ground sites or can be developed at little cost or floating platforms on rivers or lakes. . . . We think it wise that the first development of helicopter services

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space cylinder with walls of selected composition and controlled hardness to give coatings of highly regulated characteristics in a minimum time.

► The Effect of End Plates on Swept Wings at Low Speed (TN 2229—by John M. Rether and James M. Watson). Theoretical and experimental studies have long since established the advantages of wing end plates in swept wings to improve aerodynamic efficiency. Now, NACA researchers have gone into the application of these devices to swept wings as a means of increasing some of the lateral stability difficulties and other adverse effects resulting from this aerial configuration.

The investigation was conducted in the Langley (400-sq.-ft.) tunnel. Purpose was to determine the effects of varying sizes and shapes of end plates on the lateral stability characteristics of a swept wing with aspect ratio 2, sweep angles 45-deg, sweptback and aspect ratio 4, taper ratio 0.6, sweepback 45.7 deg. Five-roll characteristics were obtained with two end plate configurations on a wing with aspect ratio 2, taper ratio 0.6 and 45 deg, sweptback to establish the effect of plates on wing coupling in roll.

The researchers found that addition of end plates to swept wings increased the lift curve slope, reduced maximum rolling rates, generally increased maximum lift coefficient, and increased longitudinal stability slightly in the low lift coefficient range.

Variations of wing stability coupled with lift coefficient was reduced with increase in end plate size. Effective dihedral at zero lift could be changed from positive to negative by lowering the end plates. And swept-wing directional stability was increased with increase in end plate size and with their placement forward.

This type action and gain/loss of effectiveness increased with addition of end plates to the swept wings. But the increase of the wing damping in roll may reduce the rolling effectiveness for some end plate configurations. And end plates located below the wing chord line reduced the adverse yaw of this type action.

#### Prestress May Up Aluminum Life

New data on the relation of prestress to fatigue of aluminum alloys used in aircraft structures indicate possibilities of increasing the life of these metals.

And these fatigue studies, now being conducted at the National Bureau of Standards, may help to determine the weakness of the metal failure.

The life of aluminum alloys subjected

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**SPRAGUE**  
PIONEERS  
IN ELECTRIC AND ELECTRONIC DEVELOPMENT

In vibration and other applied or free  
loading loads may be affected materially  
by applying stress to the metal before it  
is used in service, recent studies by such  
men as J. A. Bennett and P. L. Skaar  
of the NACA mechanical metallurgy lab  
have shown

In some instances, the post-stress  
treatment increased fatigue life con-  
siderably—especially at lower stresses  
when a comparatively small number of  
cycles of dynamic stresses were applied.

But there were instances where little  
if any improvement resulted. And at  
some stresses, the fatigue life was short-  
ened by the process.

► **Conditions Approximated**—One of the  
difficulties in applying the results of lab  
tests to actual installations is that in  
many structures, the stresses vary in a  
random manner—in an unrepeatable way,  
which must support not only the weight  
of the craft in steady load, but loads  
from gust loads as well.

In approximating this situation, the  
cumulative effect of fatigue stresses at  
two or more amplitudes, was simulated  
using specimens in *slay* stress specimens  
for tests.

The specimens applied these two  
methods of pre-stressing.

► **A high static load** was applied to the



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operation before the start of the fa-  
tigue test.

► **The specimen** was stressed in the  
high-frequency machine for a predeter-  
mined number of cycles at one am-  
plitude, then turned to failure at another  
amplitude.

Then data were recorded on the  
effects of both static and dynamic  
stresses, applied prior to the test, on the  
fatigue properties of the material.

Conventional repeated loading in  
tension-tension machines was used, but a  
new specimen design was employed that  
provided several advantages over the  
usual type. Another innovation was a  
test that simulated the stresses before  
loading, and automatically located the  
point at which the stress would be a  
maximum.

► **Static Prestress**—Static pre-stress  
specimens were with 1451. Applied about  
fatigue tests with these specimens were  
made in unidirectional loading.

First specimens were tested without  
prestress to establish typical relationships  
between amplitude and frequency in  
fatigue of the material. Next a static load  
was applied to other specimens before  
start of the test. In some cases, the  
loading level in the fatigue test was in  
the same direction of the static load and  
in others these directions were opposite.

► **Opposite Prestress Effect**—At the  
higher test stresses (15,000-18,000 and  
18,000 psi), effect of static pre-stress  
was negligible.

At a test stress of 20,000 psi, there  
was an appreciable drop in life for these  
specimens pre-stressed in direction op-  
posite to the later fatigue stress.

But there was a slight increase in life  
for specimens with a great static stress  
in the same direction. Yet results ran a  
10 to 1 difference in life between these  
two sets of specimens.

► **Dynamic Resonance Effect** of dynamic  
prestress was studied on four 2451  
specimens. Fatigue loading was applied in  
completely reversed bending. Prestress  
amplitude was applied for a given num-  
ber of cycles before the specimens were  
taken to failure at the test stress. Three  
values of pre-stress amplitude and four  
test stresses were used.

At the two higher pre-stress ampli-  
tudes (12,100 and 12,500 psi), fracture  
occurred earlier in the pre-stressed  
specimen than in the original, unaltered,  
specimen. And at a portion of the fatigue  
life in need up by the pre-stress stress.  
Within experimental error it was found  
that this portion was about equal to the  
ratio of the number of cycles run at a  
given pre-stress to those which will  
cause failure at that stress.

For the lowest pre-stress (11,000 psi)  
the behavior was entirely different. At a  
slightly higher test stress (20,000 psi),  
there was a substantial improvement in  
specimen life in spite of stress being at  
high as 400 percent.

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describes the search equipment, the somewhat less involving the station (Van de Graaff generator) is the hanging of elements charged particles to very high speeds and high energies. The device does this by "kicking" the particle slowly up a high "electrostatic" on a moving, insulated belt, then dropping it from the top of the "belt" onto the test specimen with a very high impact.

► How It Does—In 1500 ft., 40-in. diameter tank, powered to 200 psi with dry nitrogen, houses the winding mechanism. It includes a highly polished, ribbed, stainless-steel accelerator tube, with each of the ribs connected by

steel steel bolts to a cylindrical support surrounding the charging belt and tube. When the generator is operating, the belt (traveling at 1000 fpm) carries elements to the top of the apparatus where they are stored on a spiral dome, building up a tremendous charge—a potential of about 2,000,000v. at the top terminal of the accelerator tube.

Released by a hot filament, these elements are accelerated down the evacuated tube, above 60 thousand volts per second around the spiral terminal target at the tube's base at about the speed of light, the tremendous energy shattering the atoms of the test metal.

## NEWS NOTES

### HULLS TESTED BY FLYING SCALE MODEL AT EDO

A great deal of research and development on the shape of flying boat hulls has been accomplished in recent years by the National Advisory Committee for Aeronautics. Improved water landing characteristics, take-off performance and cleaner aerodynamic design which have resulted from these tests indicate that the flying boat can play an increasingly important role in naval and commercial aviation.



To evaluate in actual usage various new flying boat hull shapes, without the tremendous expense of building full-scale prototypes, the Navy turned to Edo, the pioneer in airplane development, to build certified scale models which could be easily built onto a modified Wedgdon. These tests, still going on with a variety of different hull shapes, have proven valuable in

the future development of flying boats of maximum efficiency for combat and cargo.

This is but one of a wide variety of projects in research and development which are currently being accelerated at Edo as additions to volume production of aircraft components for leading aircraft manufacturers and naval equipment for the United States Navy.

EDO COINTEGRATES The largest Edo floats ever made were those designed and built by Edo during World War II for the Douglas C-47. These floats were 43 feet long and 6 feet across, and displaced 14,500 pounds each. Each float was equipped with a water landing wheel and nose wheel, making them the largest amphibious floats ever made.

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•A famous general of the U.S. armed services recently said, "When an airplane is sitting on the ground, it's going to waste."

This applies to commercial air transports as well as to military aircraft. And today, when all aircraft are vitally needed to help sustain our fighting forces overseas and our defense drive at home, Douglas is making every effort to keep more airplanes in the air more hours.

Much of this effort consists of manufacturing and

delivering spare parts. For, under stepped-up flying loads, aircraft parts need replacement more often. Without them the plane is "going to waste."

Supplying tons of spare parts every month for aircraft in all parts of the world is just one segment of the vast Douglas operation. In addition to the many aircraft models currently coming off the production lines, Douglas engineers and research experts have under development advanced types of aircraft, guided missiles and electronic equipment.

Skilled engineers and technicians find Douglas a good place to work!



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## EQUIPMENT

### New Hangar Comes Apart in the Middle

Speedier operation will be possible from unique Mitchell Mobilhangar.

Prototype of a new and significant aircraft hangar useful for both commercial and military purposes is nearing completion at the Maytag Corp. Air Station, Claverly Point, N. C.

And several airlines, says its inventor, John Mitchell, have expressed interest in the hangar, especially for small or aviation stations. Among these carriers are Northeast, Capital, TWA and Air France.

Interesting feature of the building, called the Mitchell Mobilhangar, is that it comes apart in the middle, allowing a plane to be driven in over the "roof" or "out of" the hangar. Elimination of complicated doors and associated operating mechanisms, heavy truss structure to give 172 ft clear span and expensive foundations, despite the cost of the Mobilhangar will bring constructional structures of similar size according to Mitchell. He adds that the current unit, whose dimensions are 172 ft wide by 100 ft long, will be completed for a total expenditure of less than \$100,000.

•Why it is Good-Engineers claim these additional advantages for the Mobilhangar.

•Both halves can be used as semi-hangars when fully separated, weather permitting.

•Hangar is detachable and can be moved from location to location. Average assembly time, including laying track, is two weeks according to Mitchell.

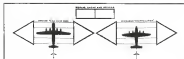
•Not being permanently attached to real estate, the hangar may be considered as a piece of equipment and perhaps depreciated over its useful life period of less than a permanent structure.

•For defense purposes, hangars could be located at the end of runways. Intrusive fighters on the alert could be kept ready and ready in the hangars. When alerted crews who would be in the hangar could be in the plane at high speed and the steps taking off on the spot. Thousands of tons of particularly important low in port fighter whose fuel capacity is limited.

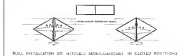
•Construction Details—The Mobilhangar is made up of two equivalent 100-ft hangars mounted on rails which



HANGAR HALVES can be fully separated, and substantially when weather permits.



DUAL INSTALLATION OF MITCHELL MOBILHANGARS IN OPEN POSITIONS



DUAL INSTALLATION OF MITCHELL MOBILHANGARS IN CLOSED POSITIONS

permit a maximum separation of 172 ft. Larger units may be provided. Each section is driven by dual 3-hp electric motors, either of which is powerful enough to do the job. Current may be supplied from outside sources or self-contained motor generators. Speed of movement is 37 ft. per min., total opening or closing taking less than 5 min. This can be accelerated if required. Thick rubber seals between mating surfaces make a totally waterproof seal according to the designer. Each triangle is mounted on three wheels—two wheels powered trucks are located at the apex of each side, single wheels at the other two sides. In case of total power failure, sides can be towed with aircraft tugs.

Back of steel and of conventional construction, the hangar is coated with corrugated Plastal. Large panels of translucent Corvair admit ample light to the hangar's interior. The 110-

ft. eave can accommodate any plane up to and including a Boeing Strato-cruiser with a part of the tail protruding through a cutout. Side walls are 25 ft. high, peak is 37 ft. ft.

•Custom Tailoring—Interior arrangements and furnishings can be radically tailored to customer requirements. Included are wall-side work benches, 740 sq ft of work space at each apex, a three-ton overhead hoisting crane to change engines. Water and electrical outlets may be pegged to bulk-panel openings placed at convenient locations on the floor.

The floor's high spot is at the center and slopes off slightly to the edges of the hangar to prevent the floor from being flooded in case of heavy rain. Heavy, dual-hatchwork tie-downs are available to anchor the hangar when very strong winds are predicted.

Designer is John L. Mitchell, 509 Fifth Ave., New York 17.

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**CABIN SUPERCHARGER TEST STAND**

This is the cabin supercharger test stand KLM Royal Dutch Airlines has recently installed at its main overhaul base, Schoofstad Airport near Amsterdam. The known (left) motor is a 150 hp electric motor through a variable-speed hydraulic transmission and gear box (center). A torque motor which takes its movement from a Wheatstone bridge loaded to the drive shaft is mounted

to the left of the gear box. Other instruments on the instrument panel include: drive shaft speed, supercharger inlet and outlet pressures, Venturi inlet air pressure, and temperature, air flow to the supercharger, blower lubricating and hydraulic pump oil pressures, supercharger and its drive pump oil flow and amplifier input. Two superchargers can be tested at once.

## Turntable Simplifies Compass Swinging

Ground compass swinging of large aircraft is simplified by mounting one of the main gun axles on a compass turn platform available currently being manufactured by Watfield Engineering Co.

Two models are available. The B-1 with a diameter of 35 in. has capacity for a 50 in. tire and is capable of 50,000 lb. The steel main USAF and Navy specification M11, T-5135 and is CAA approved over the earlier.

The B-2 model has a diameter of 64 in. and a capacity of 100,000 lb. Watfield has also developed a 10 ft diameter model for the B-16 with a capacity of 150,000 lb.

Address of the company is: P.O. Box 471, Coon's d'Almeida, Idaho.

## USAF Orders 4000 High Intensity Lights

The USMC has contracted for 4000 new type high intensity runway lights developed by Watfield.

The new units use a cut joint multi-glycine lens to distribute light in a definite pattern through a 360 deg circle around the light. Two strong beams of light are projected at 150

deg to each other and parallel to the axis of the runway. The 150 deg fan of light emitted by the pattern of the light away from the runway shows a definite pattern to help the landing pilot orient himself with the runway.

The 150 deg fan of light showing towards the runway is very dense to avoid reflecting and blinding the pilot.

The lamp uses a 200w bulb and operates at 270w, circulating temperature. It is supplied with a breakable fuse designed to give it shock, the unit is said to be much easier to maintain than previous types of comparable runway lights.

## British Units Cool Ambulance Planes

Cooling airplane stretchers cover from below, is being accomplished by British code refrigeration units at stations by means of refrigeration and England.

First of the unit, called the "Gaulin Mission" are in operation at Negombo, Ceylon, where they are used to maintain tolerable temperatures inside the RAF Hastings ambulance planes. Other units will be installed at such stops as Muscat, India. Has been used at Lumb, India.

Manufactured by the M. L. Co., the units are made 2 feet of size 10 feet

## On the New Douglas Super Airliner Safety Glass BY PITTSBURGH

Doesn't glazing a prominent feature of this new DC-4 is another example of Pittsburgh's contribution to safe transport of travel. It is designed to provide clear unobstructed vision through all light and sight openings in this so reinforced, pressure-resistant, superior, under all weather conditions.

The windshield is constructed to withstand excess pressure and the stresses of high speed operation in various altitudes, classes of air carrier or of Hercules (from page 11, G-1) and as much as 100 ft. of wind (from 100 ft. and glass and plastic) with more between for its construction of wire or 80 ft. in no danger of being torn or being so surface with the pilot's side, speed operation of the plane.

Safe working, larger than those of any other, or later are made of two layers of heat-treated glass or plastic between. The results in perfect looking and looking in and out of the plane, all passengers of a clear outlook.

On practically all the latest models of military and large commercial planes, you will find other Pittsburgh products such as windows from Safety Glasses, transparent laminated plastic, photographic glasses and pressure resistant bullet and ball-resistant glasses.

Pittsburgh has also developed advanced glazing methods which provide ample safety and structural strength and perfect flush mounting of flat and curved panels of all sizes and shapes.

The products line of glass-making experience which we have accumulated during many years of service to the aviation industry and we are proud to supply our products (including as it the dependability of all our products, large and small. We are in a position to bring you new products which involve airplane Safety Glasses and glazing technique to Pittsburgh for prompt installation. Pittsburgh Plate Glass Company, 21171 Grant Building, Pittsburgh 20, Pennsylvania.



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## NEW AVIATION PRODUCTS



### Speedy Rigging

A quick disconnect tamable with a lever which provides a good grip and makes it easy to connect cables under tension has been developed.

Disconnects can be made without disturbing the tamable adjustment simply by cutting out wire loop which releases the lever or the closed position. No tools are needed to adapt tension at the "Speed-Rig" lever provides an easy method of forcing the barrel, says the maker.

The unit is designed to withstand 110 percent of the breaking strength of the cable. It is designed with a small connection area to operate efficiently in confined areas. The device is available in the standard tamable type which fits mating tamable terminals, and the winged type which may be reared directly to the cable, also mating terminals. The unit will fit cables of 1/16 through 1/4 in. dia. Made by Pacific Scientific Fuel Co., 1490 Grande Vain Ave., Los Angeles.



### Low-Cost Mask

Expendable "Kono-Mask" are designed to meet the oxygen needs of airlines and executive plane passengers at a fraction of the cost of conventional rubber masks. They are made by Scott Aviation Corp., Lancaster, N. Y. The plastic releasable bag, nor-

mally discarded after use, is rugged enough to be used over many times and its storage life is equal to that of regular masks, according to the maker. This could mean added savings where the Kono-Mask finds application. Provided with the mask for passenger use are a plastic tube and mask connector which fits the oxygen outlet in the cabin.

This is the second oxygen mask for transport passengers introduced by Scott Aviation, the other being a reusable mask (Aviation Week Mar. 3, p. 34).

### Speedy Fastener

A small, low-cost metal fastening designed for use with screws, rivets, bolts, pins, metal brackets, panels, brackets and other parts that may have to be readily removed or installed has been developed by the American Shower Door Co.

The "Thursen" fastener, as it is called, can be inserted from one side and requires only the drilling of one 1/16-in. hole. Thumb pressure is sufficient to lock it in place and a quick pry with a screwdriver will release it. The fastener gives tensile and will not slide loose, according to the maker. It comes in two sizes, in hole sizes ranging from 1/4 to 1 in., and for metal thicknesses up to 1 in., says the company, whose address is 1033 La Brea, Los Angeles.

### ALSO ON THE MARKET

Improved Cherry River head gear are designed for easy operation. Construction modifications also have increased capacity of truck and service life, says maker, Cherry River Co., 215 Winton St., Los Angeles 15.

Double step-ladder is designed to increase work capacity and maximum clearance of standards. Platform at top accommodates two or more people. Empty, 10-in. high ladder rolls easily on wheels, but weighted with persons, it is secured to floor by rubber-tipped legs. Made by Bellman Co., 119 Pennsylvania Ave., Wayne, Pa.

Portable steam space heater for hangars and other large areas is designed to give clean, safe heat where there ordinarily might be danger of carbon monoxide poisoning. Heater is fully automatic and oil fired. Made by Quat Airworks and Oil Fuel Co., 131 Brookfield Ave., Norwalk, N. J.



### NO MORE FRONTIERS?

From oceans to the outer wall, there's no frontier the aviation industry has not crossed.

And each crossing has meant withstanding more greatly elevated temperatures—high, negative speeds—more grinding placement of every functioning part—especially upon ball and roller bearings.

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Designing and building compact, light and efficient equipment for cooling and pressurizing aircraft is a Sverdrup specialty. Typical of Sverdrup's aircraft engineering is the air cycle cooling unit which conditions the air for the cabin of the Boeing B-71. **Reaching less than 15 pounds** it delivers 400 pounds of cooling capacity. Fuel consumption is 100 percent. Like other Sverdrup equipment it can be relied on to give long and trouble-free service. Sverdrup cooling units with air flow capacities ranging from 32 pounds/hour to 50 pounds/hour are standard equipment in many combat aircraft of the Navy and the Air Force.

Some firms, organized to the private requirements of the institution, are more or less typical military units as the McDonnell F2H2, Douglas XA2D, the North American YF84 and such commercial aircraft as the C-119 and the RF-101.

Those who build and equip the rooms adopt an old knee-high good engineering comes in small packages.



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## PRODUCTION

## How to Up Your Tool Productivity

Engineers tell how to better performance, increase life and speed operations of industrial machines.

Production know-how for speeding of industrial substitution tool, an added triumph: when process experts exchanged new data at the recent annual meeting of the American Society of Tool Engineers, at New York.

► **Meaningful Measurability**—A new approach for assessing determining useful measurability was described by Bruce

• **Carbide Tool Capabilities**—Industry hasn't even begun to scratch the peaks at which metals can be machined with carbide tools, as the owners of W. R. Cowing, general superintendent of Rose-Hulman Inst. of Technology, West

Holding that look can be developed to increase machine output considerably, Cowney told company tests indicate that cutting speeds through steel at about 16 mph is better or better is entirely feasible, the firm's requirements being dictated by the work.

As cited in experimental work where neither cutter and workpiece remained cool at 1435 lbs., with 870 in feed per tooth. When feed was reduced to 4 lbs. per tooth, cutter and material became too hot to touch, indicating that

In another trial, a plowing machine consumed 92 hp when cutting steel at 106 ipm; but power consumption dropped to 53 hp when speed was tripled.

Another steel railroads rolling mill was given by Thomas, Betger, of Westinghouse Electric Corp.'s Headquarters Mfg. Engineering Lab. Pittsburgh. He said that high speed steel rails still are made with steel, but rails are being replaced by carbides to cut production time and improve



Explosion-free productivity can be increased on older machines, tools which ensure the superior cutting synthesis of carbides. Dr. W. R. Fries of Union Carbide Corp., Allentown, described

double, thread count will drop: subject about 75 percent over a single thread ball.

Prone reason called for improved tool life for multiple threaded units in clutch hobbing was better they had distribution obtained on the left tooth. When multiple threaded hob as used they recommended that these should be of larger diameter than comparable single threaded units to permit employment of a larger number of flutes. Spiral ground multiple threaded hobs are preferred in straight ground hobs. These comments recorded.

► **View on Tolerares:**—Ringsdorf first rational approach he takes in the specification of tolerances for the purpose of breeding production and growing corn. Massachusetts Institute of Technology's Professor Paul Buckham, grain author, contended that most standard corn tolerances frequently are chosen to please, not rather than because of any definite need for such tolerances.

Holding that too many are looking for some form of standardization to save prefabricated specs that will relieve the necessity for analytical thinking, Buckingham cited examples of past applications, showing how analytical approach to specification of tolerances could cut manufacturing costs and step up output or avoid failure of parts or systems.

► **Poor Utility**—Industries can get greater production from mechanical power through a thorough analysis of the mechanics of these machines. It was my goal to do this. D. Donnelly, who was engaged with the Central Service Administration, Washington, D.C.

His self-described method for authoring gave others perceived computer advantages and insights.



### BUCK FOR ASSEMBLING R3Y-1 BULBS

Cresco has set up this massive bull semen bank to be used in breeding RHT's topgun Angus cows at San Diego. The base structure, 170 ft. long and 65 ft. wide, uses much less steel of steel pipe, but two with as little as RHT built one is maddled simultaneously. Weighing more a million pounds, it is a tremendous





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CHRYSLER REP. AIRWAY & POWER ENGINEERING CORPORATION LIMITED

In September, 1949, the stockholders in its bid actions that were being taken to put the company "in a substantially improved position with respect to its future earnings. New management could point to the report in confirmation, and add a further note that the company was not only in a negligible degree due to the post-Korea defense order.

Last year, it did in the four preceding years, C.W. paid out more in dividends than it earned. That was because of the large cash surplus the corporation had at the end of the year passed from the stockholders and eventually the company for a dividend of C.W.'s for the 1949 results indicate that that situation may be at an end.

Not only does C.W. now have a fat backlog—\$108,490,000 as of Dec. 31, with more added since—but the report also indicates significant change in C.W. operations. C.W.'s costs and expenses in 1949 were \$125,997,583 against approximately \$7 million more in sales in 1949, costs and expenses were trimmed to \$127,910,015.

## Republic Aviation Reports Sharp Gains

Just about the most impressive increase in business among the major aircraft manufacturers was reported last week by Republic Aviation, Inc., in its closing that its backlog is over 1200 per cent that as Dec. 31, 1949.

Unfilled orders totaling more than 9500 millions would mean to sell for either a major expansion of the F4U fighter, N. Y. company, or else a production program spread out over several years. Republic already has made great strides in preparing for its increased commitments. Last January, employment was down to about 4900; it is now 9100 and still climbing.

At the close of last year, the Republic backlog was \$245 million. An almost equal amount of business has come in since that time. At the end of 1949, the backlog was \$25,983,000.

Republic's income for the year ending Dec. 31, 1949, was \$7,543,676 compared to \$48,421,914 in 1949. Profit after taxes, including depreciation, from \$278,652 in 1949, to \$2,515,806 last year.

## Airframe Shipments Decreased in 1950

U. S. aircraft shipments (including a checked figure on U. S. army shipments) totalled \$224,480 in 1950 as against \$224,480 in 1949. The percentage of shipments has decreased, as compared to 6,744,480 in a comparable base for 1949.

December 1949 shipments of aircraft

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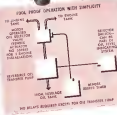
The Bendix-Pacific Oil Transfer Timer eliminates the multitude of relays and complicated wiring otherwise required for complete automatic scavenging of oil transfer lines.

Engine oil in untested lines will solidify and prevent further transfer of oil unless it is removed after each transfer. Without numerous relays and wiring to do the job, the Bendix-Pacific Timer accomplishes this operation automatically, relieving the operator of all details.

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5. Valve is returned to normal.
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plane cost amount amounted to 105 places valued at \$5 million, with average weight at 502,790 lb. This cost paid with several shipments in No number of 242 places valued at \$55.1 million.

Aircraft engine shipments in 1950 to other than U. S. military customers totaled 1,046,893 hp, as compared to 1,331,500 hp in 1949.

The summaries were based on reports from 33 aircraft companies operating 19 plants and ten engine companies operating 12 plants.

December employment figures of 232,991 in aircraft plants and 59,658 in engine plants were reported, showing a gain of approximately 5 percent in employment in both types of plants over November figures which were 213,564 and 45,374.

## AF Invitations

Bid openings are 20-30 days after agency make room dates shown in the following bid synopsis. Bid sets concerning specifications are done to be processed and be sent to qualified applicants who state bid invitation number.

One bid set will be available for review without obligation by prospective bidders, also bid publication data, at each of the seven AFMC procurement field offices. This will enable firms to see specifications before writing or telegraphing for their own bid sets.

Procurement field office locations: Rome Army Base, Station 10, Rome, Connecticut; Aircraft Plant No. 4, Ft. Worth 1, Tex. 1660 E. Hyde Park Blvd., Chicago 17; Wright Patterson AFB, Dayton, Ohio; West Warner and Longue Ave., Detroit 12, Mich.; W. Washington Blvd., Los Angeles 42; Bond St., N. Y. 5.

### INVITATIONS

Contracting machine services: 15 each, bid invitation No. 11-1071, issue date 12 Mar., delivery to start in 30 days, complete within 120 days.

Steel working machines: 117 each, bid invitation No. 11-1071, issue date 12 Mar., delivery to start in 30 days, complete within 90 days.

Lathe, turret, 15 each, bid invitation No. 11-1071, issue date 12 Mar., delivery to start in 30 days, complete within 90 days.

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Lathe, turret, 15 each, bid invitation No. 11-1071, issue date 12 Mar., delivery to start in 30 days, complete within 90 days.

AVIATION WEEK, April 9, 1951



## NEW! VHF COMMUNICATIONS ANTENNA FOR AIRCRAFT



This is a portrait of the new Collins 57B-1 antenna, made expressly for use with the Collins 518-17L two-way VHF communications system. It is designed for the most efficient radiation and reception of vertically polarized communications signals in the frequency range of 118 to 136 megacycles. Note the excellent radiation pattern and standing wave ratio graphed on this page.

The 57B-1 mounts externally on the skin of the aircraft. Its mounting base, designed with the Collins type 377-2 feed antenna, greatly simplifies installation especially on pressurized aircraft. Only the feed connector protrudes through the skin of the ship.

We invite inquiries and investigation of this highly specialized and effective development.



Left to right: Collins 17L VHF communications antenna (mechanical) and 57B-1 VHF communications antenna (feed connector) as installed in aircraft fuselage at field installation.

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## FINANCIAL

### Investment Trust Holdings of Aviation Equities

(% of Total Assets)

INVESTOR	NUMBER OF SHARES HELD	CURRENT MARKET VALUE \$.	% OF TRUST HOLDINGS
<b>AMERICAN—Common</b>	100,000	\$4,100,000	20
<b>Boeing—Preferred</b>	50,000	\$4,000,000	19
<b>Chicago &amp; Southern</b>	10,000	1,000,000	5
<b>Dallas</b>	10,000	1,000,000	5
<b>Eastern</b>	10,000	1,000,000	5
<b>Midland</b>	10,000	1,000,000	5
<b>Southwest—Common</b>	10,000	1,000,000	5
<b>United</b>	10,000	1,000,000	5
<b>West</b>	10,000	1,000,000	5
<b>YFA</b>	10,000	1,000,000	5
<b>Western</b>	10,000	1,000,000	5
<b>AMERICAN</b>	100,000	4,100,000	20
<b>Boeing</b>	50,000	4,000,000	19
<b>Chicago &amp; Southern</b>	10,000	1,000,000	5
<b>Dallas</b>	10,000	1,000,000	5
<b>Eastern</b>	10,000	1,000,000	5
<b>Midland</b>	10,000	1,000,000	5
<b>Southwest—Common</b>	10,000	1,000,000	5
<b>United</b>	10,000	1,000,000	5
<b>West</b>	10,000	1,000,000	5
<b>YFA</b>	10,000	1,000,000	5
<b>Western</b>	10,000	1,000,000	5

### How the Funds View Air Stocks

Aircraft and airline shares, though widely held, do not rank among 'Favorite Fifty' in portfolios.

Aviation securities are not yet very popular with general investment trusts. This is revealed in an exclusive American Wire survey of holdings of aviation shares in portfolios of investment funds.

Not a single aviation company was included among the first 50 stocks favored in the acquisition of holdings of more than 155 closed-end trusts and mutual funds as prepared by Augustin & Co.'s "Guide to Investment Trust Portfolios."

► **UAC** Top Aircraft Firm—The closest any aviation company came to the "Favorite Fifty" was United Aircraft Corp. with an estimated 55 million of its common shares held by a total of 33 trusts.

The complete list of aviation shares owned by investment funds is included in the accompanying table.

In a few instances, concentrated control in several investments must be distinguished from popular interest among the trusts. For example, in the case of Boeing, the Alfa Corp. owned

422,480 shares, or 18 percent of the total outstanding stock at the 1950 year-end.

While set down in the above table, Alfa also owned 290,000 shares of Northwest Airlines common (52 percent of the total), and 77,000 shares of the company.

Similarly, First York Corp. owns 212,000 shares, about 49 percent of the total Bell Aircraft Corp. issue. Other trust interests in the Bell-based aircraft division account for a total of 50,780 shares.

► **AA** Top Airlines—In the airline group, American has the largest number of trusts, 25, owning its common shares. It also represents the biggest nonaircraft aviation investment for the trusts through its combined preferred and common shares.

The distinction of the largest percentage of any airline capital stock owned by general investment trusts goes to Eastern. The 22 trusts are owning for 175,900 shares of Eastern,

collectively own 7.9 percent of the corporation's stock.

Another top airline favorite is United with holdings of 121,800 common shares distributed among more than 19 funds. The largest investments in Chicago & Southern, Delta, National, TWA and Western are owned by the specialty aviation funds such as National Aviation, Group Securities and Aeronautical Securities.

Of the four funds owning 69,200 shares of Northwest common, 40,000 represents the longtime holdings of Incorporated Investors, whose president is a director of the airline.

In the aircraft group, general investment funds favor United Aircraft, Douglas, North American, Cessna and Lockheed, in the order named. Such holdings of United Aircraft represent about 8.7 percent of that company's common share base. Similarly, the holding of 24 trusts of Douglas stock constitutes 8.5 percent of the company's shares.

In these instances and a few others previously mentioned for the aircraft, investment trust holdings, while representing the largest aggregated blocks of ownership, are far from being able to exercise effective control. (This includes the specific control as found in the cases of Bell, Cessna and North east.)

► **No Unanimity**—In view of developments set in motion since Korea, it is interesting to note that professional fund managers were inclined to favor aviation while liquidating securities during the latter part of 1950. As in the past, however, there was little consistency among these trusts. It was not uncommon for one fund to be buying while another was selling the same aviation security. For example, during the second half of 1950, Wellington Fund purchased 3000 shares of American Airlines preferred while Affiliated Fund liquidated 6000 shares of the same issue.

There was a decided tendency to swing out of Northwest Airlines as reflected in the common stock sales at difficulties. This is another characteristic of most funds—their frequently after common stocks are known and substantial market moves have been completed.

It is noteworthy that the 128 trusts surveyed controlled investible assets of over \$1.5 billion at last count. Should even make a very small segment of these funds be based on the aviation group, the impact of their investment buying could be of substantial proportions. As aviation companies continue to develop potential earnings and cost-cutting dividend investments they will attract a large measure of investment support.

—Selig Aicholz

## 30

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## Freight Leaders

Air cargo character is changing radically in mid-1950s. Miscellaneous mail, the last away from jet routes about mid-1950, is an analysis of air freight by United Air Lines shows.

For the full year, here is the order of volume: machines and machine parts, not flowers, electrical equipment, radios and radio parts, automotive parts and accessories, wearing apparel, aircraft parts, dry goods, printed matter, hardware.

## Transcontinental Facts Announced

American, Boeing, Delta, Continental and National have made the inter-city agreements recommended by the Civil Aeronautics Board to give southern one-plane service to the west (Aircraft Week Feb. 19). The three southern transcontinental airlines will use DC-6 aircraft.

On a Miami-San Francisco trip, for example, a National Airplane can will just out at Miami, a Delta one will



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take over the same place at New Orleans, and an American one will fly the place on its San Francisco from Dallas.

The other two basic routes are: • **Atlanta-West Coast**, via Delta flight one to Dallas; • **Worth, American** one from Dallas.

• **Houston-West Coast**, via Boeing one to San Antonio, Continental one to El Paso, American the rest of the way.

Quick CAB approval is expected, as CAB itself recommended the agreements.

## Can Airliner Designs Ignore Service Needs?

Airlines can design their future plane designs as conveniently as possible, forgetting about airframe-type and weight specifications, a reliable Pentagon source says.

The services themselves—Air Force and Army—will order such special types as the four-engine Douglas C-124 and assault transports, such as Fairchild C-119 and C-119C. A current example of this policy of the services ordering their own transport requirements is the 25,000-lb. payload all-terrain transport now in development from state with an April 15 deadline (Aircraft Week Mar. 19). Another example is the fact that Air Force is not supporting a four-engine prototype construction program at this time.

But the Air Force will require a few more provisions for quick adaptation of airplanes to military shift operations. Economic considerations makes airlines and their planes the almost-ideal passenger airliner, says a source (this is now assumed). The same, say some, true for air freight in this decade, officials hope. Meanwhile, Air Force is sponsoring its own air freight plane development.

Medium-size plane still call for cluster of airframe services by the Air Force in case of need.

## BOAC Gets Comet For Operation Tests

The second Comet jet transport ordered by the Royal Air Force has been sent to British Overseas Airways Corp. to gain operational experience with the craft.

Test trials, including flights, England to Calcutta, will study air traffic control, operating techniques, maintenance conditions at high altitudes on various routes, radio communications and radar assistance.

The Comet is one of two ordered by the Ministry of Supply. BOAC expects to start taking delivery on its two lots of 14 Comets this summer.

## Lower Pilot Time

The Canadian government facing a dwindling supply of civil commercial pilots, plans to modify the regulations to permit pilots to be used in private planes, with 10% to be used in the 200 hr flying time previously needed. The shortage has been brought on by a loss of civilian pilots to active duty with the RCAF, Trans-Canada Air Lines and Canadian Pacific Air Lines.

## C-123, P2V Cited

Eastern Air Lines chief engineer Charles French says there are two military planes readily adaptable to conversion as freighters—the C-123, in search transport, and the Lockheed P2V, a Navy patrol bomber.

As for land service airlines, French says the helicopter will be more practical than the fixed wing, conventional plane for loads of 200 miles or less.

## SHORTLINES

► **Airlines Clearing House**—Interline traffic business of scheduled airlines through the Clearing House in February totaled \$15,702,859—a 39 percent gain over 1949.

► **Booth Ocean Airways**—BOAC has opened a Boston office at the World Traveler Two of the World's London flights will stop at Boston starting May 1 subject to U.S. approval. Earl J. Whittier, a office manager and sales manager in New England.

► **Eastern Air Lines**—Perhaps signing the newly studied CAB, says, in view of a price based decision, Eastern is filing its second petition of reconsideration of the Southern Transcontinental-West decision. CAB threw out Eastern's bid for a southern transcontinental route—without effect. Eastern changes between the airlines to provide southern service to the West (Eastern's new petition has been changed, American Airlines get into San Francisco after its third petition for reconsideration).

► **Flying Tiger Line**—Tigers have cut west cost again—this time on the route, both and across classification, down 25 percent. Company reports such reductions as business traffic have already been cutbacked freight substantially. Tigers have set up a foreign air freight department, headed by J. John Zabolos. He will develop foreign traffic on the domestic system of the carrier, which system can start major U.S. cargo cities with West.

# SPS AIRCRAFT FASTENERS

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DRAWING CHECKING  
ELECTRONICS  
FLIGHT TEST  
FLUTTER AND VIBRATION  
HANDBOOK WRITING  
ILLUSTRATION TECHNICAL  
SERVO MECHANISM

STRESS ANALYSIS  
STRUCTURAL TEST  
TOOL DESIGN  
WEIGHT CONTROL  
AIRCRAFT DESIGN  
JET ENGINE CONTROLS  
POWER PLANT ANALYSIS  
RAMJET ENGINE DESIGN  
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Limited number of openings also available for mechanical engineers, engineering business and electronic technicians.

Top starting pay . . . rapid advancement based on individual merit . . . liberal employee benefits . . . bonus for extended work week

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"Moms of the Bomber"

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AIRFRAME DESIGNERS  
ROTOR STRESS ENGINEERS  
LOFTSMEN  
DRAFTSMEN (Layout & Check)  
PRODUCTION PLANNERS  
TOOL, JIG AND FIXTURE  
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## PERSONNEL MANAGER

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WINDSOR LOCKS, CONNECTICUT

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Engineers

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Lockheed invites you to join its long-range production program, building the aircraft of today—and tomorrow.

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A. V. HARTSON  
Recruitment Manager

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Burbank, California

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Available for Qualified  
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SCORE BASIC QUALIFICATIONS:  
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**PAN AMERICAN  
WORLD AIRWAYS**  
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ENGINEERS  
in  
CALIFORNIA

Positions now available for experienced aircraft engineers

ELECTRONIC SPECIALISTS  
RADAR TECHNICIANS  
AERODYNAMICISTS  
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SPECIALISTS IN AIRCRAFT  
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DEVELOPMENT

with background in  
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Send resume of experience and technical training to  
Director of Engineering

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AERONAUTICAL COMPANY  
Lindbergh Field  
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For Major Breaks on your Pontiac, Oldsmobile, Buick, or Cadillac, call  
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Goodyear Aircraft Corporation, one of the oldest aircraft development organizations in the field, now offers unusual opportunities to engineers, qualified through educational background and experience, in all phases of aircraft design and development.

A foremost producer of military aircraft during World War II, Goodyear Aircraft is continuing its long-range program for the development, design, and maintenance of a highly diversified line of products. In addition to currently manufacturing airplanes and missiles, the company also designs and builds a number of vital components, including wheels and brakes, plastic aircraft components, guided missiles, radar, and other material for the defense program.

The diversification of products at Goodyear Aircraft Corporation has resulted in an unusually stable and progressive organization throughout present years.

You are invited to investigate these opportunities by submitting a resume of your qualifications and experience, which will be given prompt and serious consideration.

Address all correspondence to Mr. C. G. Jones,  
Salary Personnel Department.

GOOD YEAR  
AIRCRAFT CORPORATION  
AYTON, ILL., CHGO

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with split plant locations, material shortages, intense personnel and space requirements problems—intended

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See Aerial Information Service

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General Electric  
Needs

Engineers and Physicists  
Positions available in our Aircraft Gas Turbine Division, Lockheed, Ohio, and Lynn, Mass. plants for experienced mechanical, electrical, aeronautical and metallurgical engineers and physicists. Please send resume to Personnel Office, Aircraft Gas Turbine Division, 923 Western Avenue, West Lynn, Mass.

**GENERAL ELECTRIC**

## AERODYNAMICISTS

**Project Leaders:** 5 to 10 years experience in handling qualities evaluation of all types of aircraft.  
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## GRADUATE ENGINEERS FOR ENGINE ANALYSIS

**Project Leaders:** 5 to 10 years experience in analysis of performance of aircraft engines (Reciprocating and/or Turbojet).  
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## ENGINEERS

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AC Spark Plug Division  
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Responsible for the establishment of systems and administrative control procedures designed to coordinate the overall activities of an expanding engineering organization. Extensive experience in aircraft engineering positions required.

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To assume responsibility for the overall planning and scheduling of expanding projects through design and development phases. Applicants must have extensive experience in aircraft engineering and organizational planning experience.

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Send detailed resume to:

PERSONNEL MANAGER  
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Custom radio and dual instrumentation, delcom, new tank, 7 parachute chairs (including pilot), 2 spare 140 engines, MTSC. March delivery. \$100,000. \$85,000.

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Luxury Interceptor 11 place, 240 mph TAS, 800 hours total time—no military (ready to use). Dual instruments (Electric-Air), control heater, 1100 Gals. capacity, Sperry Zero Easler and C-2 Gyrocompass, Collins 165 and 17E1, ADC-34 Channel, 3 ADF, A.S.C. 11 CMH, etc. Edson No. 10 detector, electric shutoff valves, exterior completely painted, many extras. Immediate delivery—price \$125,000 to \$100,000 depending on spares.

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CABANY 5425

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Custom equipped, 14 seats, 240 mph TAS, 800 hours total time—no military (ready to use). Dual instruments (Electric-Air), control heater, 1100 Gals. capacity, Sperry Zero Easler and C-2 Gyrocompass, Collins 165 and 17E1, ADC-34 Channel, 3 ADF, A.S.C. 11 CMH, etc. Edson No. 10 detector, electric shutoff valves, exterior completely painted, many extras. Immediate delivery—price \$125,000 to \$100,000 depending on spares.

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Custom equipped, 14 seats, 240 mph TAS, 800 hours total time—no military (ready to use). Dual instruments (Electric-Air), control heater, 1100 Gals. capacity, Sperry Zero Easler and C-2 Gyrocompass, Collins 165 and 17E1, ADC-34 Channel, 3 ADF, A.S.C. 11 CMH, etc. Edson No. 10 detector, electric shutoff valves, exterior completely painted, many extras. Immediate delivery—price \$125,000 to \$100,000 depending on spares.

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ABC GMAI AIC-3 Tons, Dual ADF  
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Excellent Condition—Low Time

Hydraulic Props.

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Custom equipped, 14 seats, 240 mph TAS, 800 hours total time—no military (ready to use). Dual instruments (Electric-Air), control heater, 1100 Gals. capacity, Sperry Zero Easler and C-2 Gyrocompass, Collins 165 and 17E1, ADC-34 Channel, 3 ADF, A.S.C. 11 CMH, etc. Edson No. 10 detector, electric shutoff valves, exterior completely painted, many extras. Immediate delivery—price \$125,000 to \$100,000 depending on spares.







## SPECIAL REPORT

## Semi-Annual Report of the Secretary of The Air Force

The attached report summarizes, from a budget stand point, the activities of the Department of the Air Force from July 1 through Dec. 31, 1958. This was a period of continuous action in Korea and of rapid expansion for the Air Force as a whole.

In the emergency created by the Communist invasion of the Republic of Korea, our Far East Air Force, which had maintained a high state of readiness, was the first of the United Nations armed forces committed to the task of opposing the attack. Its first mission was to evacuate American nationals from the threatened area, its second, at the direction of the President, was to resist the enemy's advance by air strikes against his forces and installations located within the boundaries of Korea.

During the early months of the Korean action, the Military Air Transport Service, aided by commercial carriers, provided a vital lifeline of men and material across the Pacific to Japan. A special task force provided a life stream

between Jagers and Kees, carrying troops and supplies into the battle zone and evacuating the wounded.

Due to the peculiar nature of the Korean action, industrial operations absorbed most of our effort. Many air units in the theater of operations were called upon to perform unapproved missions because their normal targets were beyond the Yalu River.

While the Air Force thus committed a considerable portion of its strength at Keesa, it became it proceeded with the establishment of a firm base for any necessary future operations. Emphasis was placed on the provision of as adequate an defense of the United States and positive measures were taken to increase our tactical air power. The ability of our Strategic Air Command to strike powerful retaliatory blows in response to any attacks against this nation was increased in a matter of urgent anxiety and to insure the possibility that a major war might be faced.

—Thomas K. Finletter

## FISCAL YEAR 1961 FUNDS, OBLIGATIONS, AND EXPENDITURES AS OF 31 DECEMBER 1960:

[illegible][illegible]

\* Figures are not after following amendments. Totals are rounded to the nearest dollar and adjusted to add to total.

[illegible]

# EEMCO technical bulletin

## Unconventional Hydraulic Pump Motor Saves Weight... Increases Efficiency

Hydraulic pump motors normally operate through a reduction to achieve pump speeds of 3 - 1000 R.P.M. Illustrated at the left is a new motor designed for high-speed pumps which requires no such reduction. Developed by EEMCO in cooperation with the designers and builders of landing aircraft, this motor was designed for an alternable pump speed of 1200 R.P.M. The motor mounts directly on the pump with an internal spline drive within the structure itself providing the coupling.

Use of this new unit achieves significant savings in weight, increases efficiency by eliminating gear loss and makes for a more compact assembly.

### New emergency standby motor for use on Supersonic Research Aircraft

Another new EEMCO development, the explosion proof motor illustrated, was designed to operate under high ambient temperatures of 700° at 30,000 ft. altitudes. Duty cycle is 1 minute at 1 h.p., 30 seconds at 25 h.p., continuous. High temperature materials and excellent insulation are used throughout. Less weight, including gear box - 255 lbs.

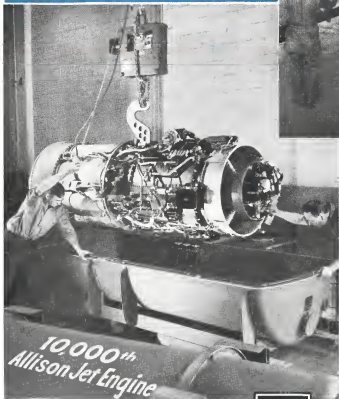
**EEMCO DESIGN AND TECHNICAL SERVICE SOLVES DIFFICULT AIRCRAFT AND MISSILE DESIGN PROBLEMS** - Just as your requirements on current, motor or submotor design problems, include preliminary data on type of unit, specific functions, special requirements, operating conditions, EEMCO can deliver operational and day available drawings, diagrams and details.

**EEMCO**

**ELECTRICAL  
ENGINEERING  
and MFG. Corp.**

**SEND YOUR NAME FOR PERFORMANCE CHARTS AND DESIGN DRAWINGS...** Enclosure, Engineering and Design personnel making request on company letterhead will be placed on mailing list for performance and design drawings of EEMCO designs for file and reference.

# Allison delivers its 10,000<sup>th</sup> Jet Engine



Builders of the J33 and J35 Turbo-Jet engines and T40 series Turbo-Prop engines.

*Allison*

DIVISION OF GENERAL MOTORS  
INDIANAPOLIS, INDIANA



**J**UST six years to the month after start of production, Allison delivered its 10,000<sup>th</sup> jet engine to the U.S. Air Force.

Built largely during a period of peacetime activity, these 10,000 engines plot a curve of increasing power and dependability. *Thrust* was stepped up more than 50 per cent per pound of weight; *service life* was extended more than 300 per cent and important improvements were made in *fuel economy*.

These vastly improved engines were in Japan ready for duty at the outbreak of the Korean hostilities. Today, two types of Allison jet engines in three types of U. S. jet fighters are in combat in Korea—spreading destruction among enemy air and ground forces with a degree of availability and reliability never before equaled.

Today, the 10,000 Allison jet engines have accumulated more than 600,000 hours in the air.

This means that Allison jet engines lead the world in experience—where it counts most—in the air.